

Deployment Plans Behind Larger IPv6 Allocations

Jordi Palet (jordi.palet@consulintel.es)

European IPv6 Task Force & Steering Committee

IPv6 Forum, Education & Promotion WG Co-chair

Consulintel, CTO/CEO



Allocations & Inputs Received

- Many thanks for those inputs !
 - Information from public sources and inputs provided directly from the people indicated below
 - Of course, non-confidential issues only included here
- In order to prepare this presentation, we have received inputs from:
 - Charles Bovy – Vodafone (NL) - 2001:1600::/31 (02/09/2003)
 - NTTWEST - 2001:0D70::/30 (12/09/2003)
 - Sunrise (CH) - 2001:1700::/27 (24/11/2003)
 - Mikael Lind – TeliaSonera (SE) - 2001:2000::/20 (10/05/2004)
 - Jeroen Van Veen – @Home Benelux - 2001:1C00::/23 (10/05/2004)
 - Wilfried Woeber – AConet - 2001:0628::/30 (20/09/1999)
 - Vectant - 2001:0F60::/28 (23/08/2004)
 - More big allocations coming, waiting for IANA ...
 - DoD (Michael Brig)



Vodafone Libertel Background

- Vodafone Libertel is a telecommunications operator based in the Netherlands, part of the Vodafone Plc group
- Vodafone Libertel operates on GSM mobile communications, holds a 3G UMTS license for deployment within the country and also provides IP services to its customers over the Internet
- Vodafone Libertel operates nationwide in the Netherlands
- Vodafone Libertel currently provides IPv4 services to corporate customers, VPN customers, internal networks and services, and internet access to its Mobile users via 2.5G GPRS and 3G UMTS
- The total number of its mobile subscribers is currently of 3.4 million

Vodafone GIN

- GIN stands for Global IP Network
 - Is the IP network between the Vodafone operators
- Besides the national IP backbone, Vodafone Libertel is responsible for the Global IP Network
- The Vodafone GIN interconnects the local Vodafone operator's national IP networks
- The Vodafone GIN is operated by Vodafone Netherlands located in Maastricht, The Netherlands

Vodafone & IPv6

- Currently Vodafone Libertel is participating in an IPv6 trial network with other Vodafone operators and intends to provide IPv6 production services in the near future on the mobile 3G sectors
- Vodafone NL holds a /31 IPv6 range
 - /32 is for the Vodafone NL company
 - /32 is for the Vodafone GIN network
- The IPv6 addressing policy of Vodafone advises to have for each Vodafone operator a /32
 - Within each operator the same addressing scheme can be used
 - The IPv6 addressing policy document describes this scheme
 - Note that is not mandatory

Vodafone & IPv6/3G UMTS

- Currently Vodafone NL has launched the 3G UMTS service
 - IPv6 is not yet used for this service
 - Plans exists to roll-out IPv6 over the IP-backbone of Vodafone NL and Vodafone GIN
- User-traffic over IPv6 is not yet scheduled
 - A lot of dependencies on other systems (GGSN, etc.)
- The idea is that we prefer each operator in each country request an own IPv6 allocation:
 - (larger) operators do not want to be dependent of Vodafone GIN regarding internet connectivity
 - In the future parts of Vodafone Plc could be sold which affects a renumbering
 - Some operators already have an allocation
 - Some political issues

Vodafone & IPv6 Customers

- According to the 3GPP specs each mobile device needs a minimum of a /64
- For corporate users/networks mobile devices a /48 can be assigned
- Personal area networks (PANs) can be attached to the mobile device

Vodafone Interviewed ;-)

1. When do you expect every Vodafone operator to request news prefixes ?
 - Each Vodafone operator needs to become LIR to get a IPv6 prefix. Some operators already have: Portugal, Germany, etc.
2. Do you believe a /32 will be enough for every operator ?
 - I think a /32 will be enough. It depends on the allocations to customers. Regarding the specs a /64 is sufficient for a customer.
3. What do you mean with IPv6 roll-out over the IP-backbone ?
 - Currently the IP backbone network is IPv4-only. In the near future the backbone of Vodafone NL and Vodafone GIN needs to support IPv6.
4. You will use dual stack or only IPv6 ?
 - I think we will use both.
5. Have you already decided (if required in some points in the network) to use any specific transition mechanism ?
 - Not yet. We have tested NAT-PT, but I think dual stack proxies are used in the future as well.

Vodafone Interviewed ;-) (cont.)

6. Any "possible" or intended schedule for IPv6 usage in 3G for user-traffic ?
(or is only depending on GGSN, etc. availability with IPv6)
 - Confidential ?
7. Do you feel IPv6 is important for 3G, or you do this only because standards mandate it ?
 - Whenever Peer-2-peer communication is necessary for a broad public, IPv6 is necessary. Especially when IPv4 addresses are rare.
8. What is your position about the usage of IPv4 with IMS ? It make sense for you using private address space, or it will break something and make more difficult to provide new applications and services ?
 - Interworking with other operators is hard to do when using private address space.
9. Are you already considering any specific IPv6 applications or services ?
 - Not yet as far as I know.

TeliaSonera (I)

- Joint application for the whole TeliaSonera group and we have also made sure that we can provide space to customers that act as small ISP, i.e. universities, since we are one of the major transit providers in Europe and to the US
 - Many companies have opted to go for many small separate blocks but we see that as non compliant with the IPv6 philosophy
 - Aggregation is an important part of IPv6 and we believe that it is beneficial for all to go for large address blocks
- One advantage for us as a company with a large address block is that it allows us to have more overhead and thereby allows for more flexibility

TeliaSonera (II)

- Our major concern right now is the vague rules when it comes to how to register the addresses
 - We would like to see a change compared to the current system for registering IPv4 addresses since it otherwise would for example mean a lot of work for us to allocate /48 blocks using DHCP to customers
- A small note was that we had to rewrite the application form since it didn't apply to this kind of application that is aimed at covering the needs for a long time

TeliaSonera Interviewed ;-)

1. Anyway, can you tell me if you have already an idea (and can be made public, just overall), about how you will split the /20 (addressing plan) ?
 - It will probably be split to allow geographical aggregation internally and at the same time make each unit a bit more independent if wanted.
2. Any specific plans for the length of the prefix that will be provided to different type of customers ?
 - We want to follow the /48 rule. The only real exception will be mobile phones, /64, but we are considering mobile services that uses /48 as well just to make it as easy as possible for the user.
3. Any specific considerations regarding 3G/UMTS deployment ?
 - We see an IPv6 only IMS deployment will be the best technical solution. I think it is a pity that most manufacturers are implementing IPv4 versions before IPv6 version even though it is stated that it should be IPv6 only.
4. What is your position about the usage of IPv4 in 3G/IMS ? It make sense ?
 - No. I believe it creates more problems than it solves. Interoperability with the entire Internet has to be possible which means that there has to be mechanism for translating between IPv6 and IPv4.

TeliaSonera Interviewed ;-) (cont.)

5. Specific plans for IPv6 user-traffic in both, the backbone and the access (and other "parts" of the network) ?
 - We are still looking into the long-term solutions for IPv6 and have not made all the final decisions so I don't think I have that much to share.
6. Plans for dual stack or only IPv6 ?
 - Dual stack. As an operator we provide Internet access and that means providing both IPv4 and IPv6.
7. Any plans for a specific transition mechanism ?
 - We are offering 6to4 and consider deploying Teredo relays for our private customers and we are offering configured tunnels to corporate customers. If you count 6PE as a transition mechanism then I would guess it is likely to be used in our networks.
8. Why do you feel IPv6 is important ?
 - Simplicity. I believe that IPv6 will bring simplicity into the network which will make it easier to for the ordinary customer but also easier for implementers when it comes to designing new services. As an operator both these things are import to help nourish our business.
9. Are you already considering specific applications or services ?
 - Connectivity and 3G is all I can mention.

@Home Benelux

- We are a large Dutch cable operator with currently about 375K customers (consumers) and about 5K business customers.
- I have requested the IPv6 block for testing in about 6 months from now and deployment for our consumer customers.
- The nearly 2 year is needed to get all equipment (cable modems) and the software (provisioning system) ready.

@Home Interviewed ;-)

1. What prefix length you will provide to your customers ?
 - We have enough for a /48.
2. Do you have already some timeframe (even if preliminary) regarding when IPv6 will be deployed in your backbone and access ?
 - No, early next year I'd say.
3. Plans for dual stack, native of IPv6 only or both ?
 - Dual.
4. Any plans for specific transition mechanisms, for example while CPEs aren't IPv6 enabled ?
 - Most of our CPEs aren't IPv6 capable so we will have to tunnel.
5. Have you already discussed with your CPE providers about IPv6 and if so, what is the feedback ?
 - No.
6. Why do you feel IPv6 is important ?
 - IPv4 will run out at some point and some things are better through in IPv6.
7. Are you already considering any specific applications or services ?
 - No.

ACOnet

- Vienna University manages (but does not directly operate) access services to the university's LAN and national R&D network for students and staff by way of xDSL and cable.
- The university has some 50K students and 4..5K staff.
 - (Exact figures are not known to me right now, because the medical faculty is being split off the main university right now. The previous figures, including the medical activities were ~70K + 6..7K).
- After quite some discussion we decided to support the recommendation in RFC3177 to assign a /48 per site, as we can assume that the majority of those networks will eventually have more than 1 physical subnet, and the subnet management is not under the university's control.
- Moreover, the customers are not forced to use or stay with that type of service, rather they are free to move to (a) different provider(s) or service with different technical and pricing details, which will involve renumbering to a different prefix.
- This approach obviously is not compatible with the whole university receiving and managing just a /48.
- So we got in touch with the RIPE NCC, presented the figures (based on the size of the university and the number of v4-based connections that we have in place already) and got an extension for our sTLA.
- Btw, just for the record, this process was very quick and painless!

US DoD

- The plan is to get the big allocation with hopefully some additional reserve to uniquely identify the DoD on the IPv6 Internet versus many parts of the DoD identifying themselves independently
 - There are lots of good ramifications to this and a few negatives also
- It is anticipated we will give back our current IPv6 allocations when this happens
- Future Combat Systems Demand:
 - Ubiquity (IP Centricity)
 - Mobility (+Ad-Hoc)
 - Operability (Security, QoS, NetOps)
- Our current networks can't fit into anything like a /32
- /16 for next 2 years = .00152% of IPv6 Address Space
 - /x (10 years)
 - /y (reserved)
 - 1.8×10^{19} (18.000.000.000.000.000.000) Host Addresses per Network
 - Permits Geospatial Addressing
 - The Soldier is a site (network of networks)

Thanks !

Contact:

- Jordi Palet (IPv6 TF-SC): jordi.palet@consulintel.es
- Madrid 2005 Global IPv6 Summit, more info soon at:
<http://www.ipv6-es.com>

